IEc

ECONOMIC ANALYSIS OF CRITICAL HABITAT DESIGNATION FOR THE CALIFORNIA RED-LEGGED FROG

Draft | September 11, 2009

prepared for:

U.S. Fish and Wildlife Service

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EXECUTIVE SUMMARY

1. The purpose of this report is to identify and analyze the potential economic impacts resulting from the proposed critical habitat designation for the California red-legged frog (*Rana aurora draytonii,* hereafter, "frog"). This report was prepared by Industrial Economics, Incorporated (IEc) and Berkeley Economic Consulting (BEC) under contract to the U.S. Fish and Wildlife Service (Service).

OVERVIEW OF THE PROPOSED RULE

2. The frog was listed as threatened under the Endangered Species Act (Act) on May 23, 1996. Subsequently, the Service designated critical habitat on March 13, 2001 and revised the designation on April 13, 2006.[1] Then on December 12, 2007, the Center for Biological Diversity filed a complaint against the Service challenging the 2006 revision. In April 2008, the court entered a consent decree requiring a revised critical habitat rule by August 2009. On September 16, 2008, the Service published a Proposed Rule revising the designation of critical habitat for the frog.[2] In support of the revised proposed rule, on April 28, 2009, the Service published a Notice of Availability of the economic analysis estimating the rule's impacts.[3] This economic analysis updates that report based on new information received since that time. A map of the proposed critical habitat is presented in ES-1.

3. The 50 proposed critical habitat units cover approximately 1.8 million acres across 28 counties in California. These proposed critical habitat units (the study area) include: approximately 70 percent private lands; 21 percent Federal lands; 7 percent State lands; two percent owned by city, county, or other local entities; and less than one percent owned by conservation groups (e.g., The Nature Conservancy) and non-governmental organizations (NGOs). All of the proposed units are considered to be currently occupied by the frog.[4]

4. The Service is considering for exclusion six acres covered by the Bonny Doon Quarries Settlement Ponds Habitat Conservation Plan (HCP), 4,097 acres of non-Federal land within the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), 92,592 acres of local land covered by the East Contra Costa County HCP,

[1] 66 FR 14626; 71 FR 19244

[2] 73 FR 53492.

[3] 74 FR 19184; and Industrial Economics, Incorporated, Economic Analysis of Critical Habitat Designation for the California Red-legged Frog, prepared for the U.S. Fish and Wildlife Service, March 3, 2009.

[4] U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the California Red-Legged Frog (*Rana aurora draytonii*); Proposed Rule, published in the *Federal Register* on September 16, 2008, Vol. 73, No. 180.

8,292 acres of local land managed by the East Bay Regional Park District and 54 acres of Federal land managed by the U.S. Bureau of Land Management (BLM) under the Spivey Pond Management Plan.[5]

5. This analysis describes economic impacts of frog conservation efforts associated with the following categories of activity: (1) Residential and Commercial Development, (2) Water Management, (3) Agricultural Crop Farming, (4) Ranching/Grazing, (5) Timber Harvest, (6) Transportation, (7) Fire Management, (8) Utility and Pipeline Construction, and (9) Habitat Management. Forecast impacts are organized into two categories according to "without critical habitat" and "with critical habitat" scenarios. The "without critical habitat" scenario represents the baseline for the analysis, considering protections already accorded the frog; for example, protections provided under the Federal and State listing and other Federal, State, and local regulations. The "with critical habitat" scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated economic impacts would not occur but for the designation. This analysis also looks at indirect costs that are the result of the influence of critical habitat designation upon other, non-Federal decision-makers. Because the Service believes that the direct benefits of the proposed rule are best expressed in biological terms, this analysis does not quantify or monetize benefits. However, a qualitative discussion of potential categories of benefits is provided at the end of the report.

6. Key findings of this analysis are presented below.[6] Throughout the report, impacts occurring prior to the finalization of this proposed rule (1996 – 2008) are referred to as "pre-designation" impacts. Likewise, impacts anticipated to occur after publication of the final rule (2009 – 2030) are referred to as "post-designation" impacts. Post-designation impacts may occur in the baseline or be attributed as an incremental result of the designation.

7. A summary of post-designation impacts is presented in Exhibit ES-2, and total impacts by activity are presented in Exhibit ES-3. Detailed post-designation baseline and incremental impacts are presented by unit and activity in Exhibits ES-4 and ES-5, respectively. Exhibits ES-6 and ES-7 present the distribution of baseline and incremental impacts on development activities by proposed critical habitat unit. Exhibit ES-8 presents the distribution of overall incremental impacts by unit. Exhibits ES-9 and ES-10 present the geographic range of post-designation baseline and incremental impacts by subunit,

[5] Chapter 1 provides detailed maps of all units, including areas considered for exclusion.

[6] As previously discussed, three existing HCPs, the Western Riverside MSHCP, the East Contra Costa County HCP and the Bonny Doon Quarries Settlement Pond Habitat Conservation Plan include conservation measures for the frog within acres considered for exclusion. For areas covered by these HCPs, frog conservation efforts are unlikely to be altered by the designation of critical habitat, therefore costs associated with implementing these conservation efforts would be attributed to the baseline. Ideally, this analysis would quantify the future baseline protections measures undertaken for the frog in the area of critical habitat within the boundaries of existing HCPs. It is anticipated that any information received during the public comment period regarding the characterization and cost of project modifications required by these plans will be included in the final version of this report.

respectively. Finally, Exhibit ES-11 provides incremental impact rankings for the top 20 subunits.[7]

8. Present value costs by time period and activity are presented throughout the report applying a discount rate of seven percent; the report tables are repeated in Appendix C applying a discount rate of three percent. Appendix D presents the undiscounted stream of impacts. Appendix B presents impacts by subunit. Administrative costs of consultations under section 7 of the Endangered Species Act (the Act) are incorporated into each Chapter corresponding to the activity for which the consultations are undertaken.

[7] A subunit is defined by a unique combination of a proposed critical habitat unit and a census tract.

KEY FINDINGS

Post-designation Baseline Impacts: Baseline impacts associated with consideration of the frog and its habitat are estimated to be $593 million to $1.43 billion ($37.2 million to $89.8 million on an annualized basis), assuming a three percent discount rate, or $510 to $1.34 billion ($46.1 million to $121 million on an annualized basis), assuming a seven percent discount rate, through the year 2030.

Detailed Baseline Impacts: In the high-end scenario, impacts to development represent between 77 and 82 percent of total impacts, depending on the discount rate applied, followed by agricultural impacts, which account for most of the remaining costs. Impacts to all other activities, combined, represent approximately one percent of the total. In the low-end scenario, agricultural impacts become relatively more important, representing approximately 49 percent of total impacts, regardless of the discount rate applied.

- Development: Development impacts are estimated to range from $288 million to $1.11 billion assuming a seven percent discount rate. The largest cost expected in the post-designation period results from project delays as developers complete the section 7 consultation process and assemble required habitat offsets. Development projects not subject to section 7 consultation may experience similar delay costs indirectly as a result of the CEQA review process. The difference in estimates depends on the length of the delay, which may range from nine months to two years depending on whether habitat offsets are requested.

- Agricultural Activities: Agricultural conservation efforts are estimated to be $219 million to $292 million assuming a seven percent discount rate. Costs stem from lost agricultural production resulting from the implementation of no-pesticide use areas for 66 pesticide active ingredients in the study area, as required by a Stipulated Injunction issued on October 20, 2006. Estimated vary based on assumptions about the size of the buffer zone used to estimate affected acres.

- Other Activities: Baseline impacts to water management, transportation, utility and oil and gas pipelines, timber harvest, fire management, and habitat management constitute about one percent of total baseline impacts under both the low and high scenarios, assuming a seven percent discount rate. Activities associated with these impacts include frog survey and monitoring, and administrative cots of consultation and are often due to the presence of the frog or other pre-existing conditions.

Post-designation Incremental Impacts: Incremental impacts associated with the designation of critical habitat for the frog are estimated to be $206 million to $589 million ($12.9 million to $37.0 million on an annualized basis), assuming a three percent discount rate, or $183 million to $566 million ($16.5 million to $51.2 million annualized), assuming a seven percent discount rate, through the year 2030.

Detailed Incremental Impacts: As under the baseline scenario, impacts to development dominate, comprising 60 to 90 percent of total impacts, with agricultural impacts accounting for almost all of the remaining costs.

- Development: Incremental impacts range from $124 million to $507 million, assuming a seven percent discount rate, depending on the delay period. The types of costs and delay periods are the same as those described above.

- Agriculture Activities: Agricultural conservation efforts are estimated to be $58.3 million to $80.9 million, assuming a seven percent discount rate. These costs result from the imposition of no-pesticide use areas in geographic regions not historically subject to the Stipulated Injunction described above.

- Other Activities: Incremental impacts to water management, transportation, utility and oil and gas pipelines, timber harvest, fire management, and habitat management constitute less than one percent of total incremental impacts, assuming a seven percent discount rate. Activities associated with these impacts are primarily administrative in nature.

EXHIBIT ES-1 REVISED PROPOSED CRITICAL HABITAT

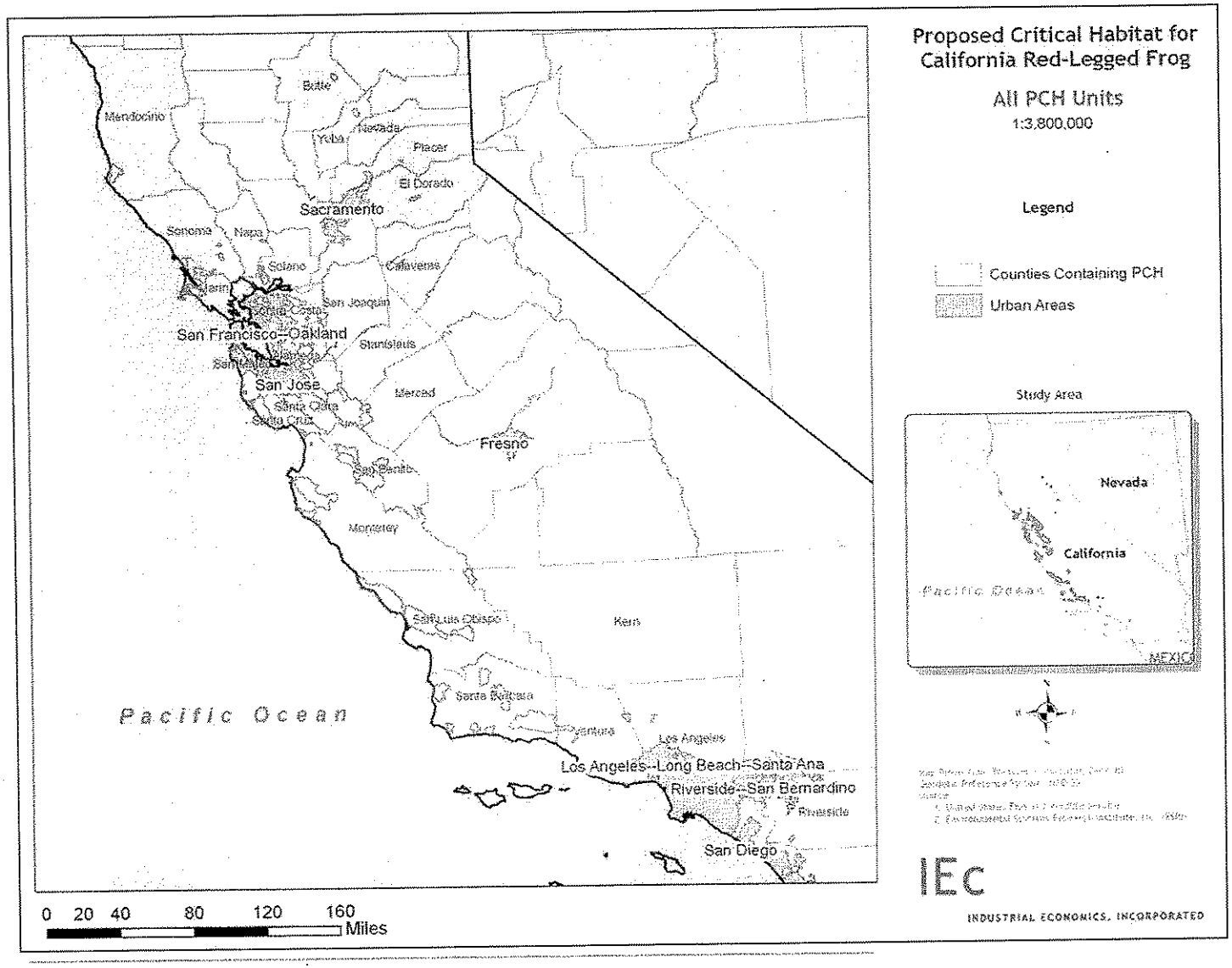

EXHIBIT ES-2 SUMMARY OF POST-DESIGNATION IMPACTS (PRESENT VALUE, 2009 DOLLARS)

	THREE PERCENT DISCOUNT RATE		SEVEN PERCENT DISCOUNT RATE	
	LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO
IMPACTS ATTRIBUTED TO EXISTING, BASELINE REGULATIONS				
Present Value Impacts	$593,000,000	$1,430,000,000	$510,000,000	$1,340,000,000
Annualized Impacts	$37,200,000	$89,800,000	$46,100,000	$121,000,000
IMPACTS ATTRIBUTED INCREMENTALLY OF CRITICAL HABITAT DESIGNATION (THE PROPOSED RULE)				
Present Value Impacts	$206,000,000	$589,000,000	$183,000,000	$566,000,000
Annualized Impacts	$12,900,000	$37,000,000	$16,500,000	$51,200,000
Note: Totals may not sum due to rounding.				

EXHIBIT ES-3 SUMMARY OF POST-DESIGNATION, HIGH-END IMPACTS BY ACTIVITY (2009 DOLLARS, ASSUMES A SEVEN PERCENT DISCOUNT RATE)

ACTIVITY	BASELINE IMPACTS		INCREMENTAL IMPACTS	
	PRESENT VALUE IMPACTS	PERCENT OF TOTAL IMPACTS	PRESENT VALUE IMPACTS	PERCENT OF TOTAL IMPACTS
Development	$1,110,000,000	82%	$507,000,000	90%
Water Management	$2,930,000	0%	$188,000	0%
Agriculture	$219,000,000	16%	$58,300,000	10%
Grazing	$0	0%	$291,000	0%
Timber Harvest	$8,950,000	1%	$11,200	0%
Transportation	$2,220,000	0%	$27,200	0%
Fire Management	$24,800	0%	$42,600	0%
Utility & Pipeline	$2,440,000	0%	$61,300	0%
Species Management	$489,000	0%	$74,300	0%
Total	**$1,340,000,000**	**100%**	**$566,000,000**	**100%**

EXHIBIT ES-4 SUMMARY OF POST-DESIGNATION BASELINE IMPACTS BY UNIT AND ACTIVITY: HIGH-END SCENARIO
(PRESENT VALUE, 2009 DOLLARS, SEVEN PERCENT)

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
ALA-1A	$55,100,000	$16,100	$0	$0	$0	$0	$0	$22	$55,200,000
ALA-1B	$39,100,000	$62,500	$0	$0	$0	$0	$0	$60	$39,100,000
ALA-2	$112,000,000	$138,000	$33,200	$0	$0	$0	$163,000	$1,670	$112,000,000
BUT-1	$0	$43,600	$0	$83,100	$0	$12,800	$0	$50,100	$190,000
CAL-1	$7,720,000	$29,000	$0	$0	$0	$0	$0	$0	$7,750,000
CCS-1	$301,000	$80,100	$216,000	$0	$0	$0	$81,300	$106	$678,000
CCS-2	$403,000,000	$246,000	$1,050,000	$0	$600,000	$0	$244,000	$1,010	$406,000,000
ELD-1	$7,500,000	$43,600	$1,790	$229,000	$0	$0	$0	$88,800	$7,860,000
LOS-1	$0	$29,000	$0	$0	$0	$9,800	$0	$6,500	$45,300
MEN-1	$56,200	$58,100	$0	$0	$0	$0	$0	$0	$114,000
MNT-1	$28,300	$29,300	$0	$0	$0	$0	$0	$54	$57,700
MNT-2	$19,500,000	$146,000	$14,100,000	$0	$890,000	$0	$81,300	$12,800	$34,700,000
MNT-3	$25,000	$71,800	$6,240,000	$0	$0	$0	$0	$3,010	$6,340,000
MRN-1	$1,520,000	$14,500	$2,530	$0	$0	$0	$0	$1,340	$1,540,000
MRN-2	$146,000	$29,000	$7,290	$0	$0	$0	$0	$3,880	$187,000
MRN-3	$1,060,000	$58,100	$139,000	$0	$0	$0	$0	$5,840	$1,270,000
NAP-1	$387,000	$14,500	$7,820	$0	$0	$0	$0	$0	$409,000
NEV-1	$3,510,000	$58,100	$2,670	$394,000	$0	$766	$0	$61,300	$4,030,000
PLA-1	$472,000	$51,500	$0	$4,400	$0	$0	$0	$27,500	$556,000
RIV-1	$1,430,000	$43,600	$26,700	$0	$0	$0	$0	$0	$1,500,000
SCZ-1	$106,000,000	$120,000	$61,400,000	$3,280,000	$74,900	$0	$81,300	$70,500	$171,000,000
SCZ-2	$75,200,000	$46,300	$54,400,000	$0	$74,900	$0	$0	$4,120	$130,000,000
SLO-1	$7,940,000	$33,500	$110,000	$0	$0	$0	$163,000	$12,500	$8,260,000
SLO-2	$43,800,000	$78,900	$10,700,000	$0	$0	$0	$81,300	$10,100	$54,700,000
SLO-3	$84,000,000	$124,000	$11,100,000	$0	$310,000	$0	$163,000	$10,900	$95,700,000

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
SLO-4	$0	$53,900	$10,700	$0	$0	$0	$0	$3,280	$67,900
SNB-1	$809,000	$48,900	$25,500,000	$0	$0	$0	$0	$1,060	$26,300,000
SNB-2	$2,440	$17,100	$48,800	$0	$0	$0	$81,300	$506	$150,000
SNB-3	$69,400	$53,000	$41,900	$0	$0	$0	$81,300	$1,870	$248,000
SNM-1	$19,900,000	$111,000	$1,590,000	$0	$0	$0	$81,300	$245	$21,700,000
SNM-2	$47,000,000	$142,000	$4,600,000	$4,270,000	$0	$0	$0	$1,530	$56,000,000
SOL-1	$5,840,000	$14,500	$56,800	$0	$0	$0	$81,300	$0	$5,990,000
SOL-2	$1,000,000	$14,500	$21,600	$0	$0	$0	$81,300	$0	$1,120,000
SOL-3	$6,100,000	$29,000	$21,700	$0	$0	$0	$81,300	$0	$6,240,000
SON-1	$120,000	$29,000	$506	$0	$0	$0	$0	$0	$150,000
SON-2	$182,000	$14,500	$15,600	$0	$0	$0	$0	$0	$212,000
SON-3	$2,070,000	$29,000	$109,000	$0	$0	$0	$0	$133	$2,210,000
STB-1	$0	$37,000	$0	$0	$0	$0	$0	$4,510	$41,500
STB-2	$7,860,000	$40,500	$2,310,000	$0	$0	$0	$81,300	$6,050	$10,300,000
STB-3	$0	$58,600	$14,800	$0	$0	$0	$0	$8,540	$81,900
STB-4	$0	$31,800	$0	$0	$0	$0	$0	$1,460	$33,300
STB-5	$39,900	$47,700	$2,970	$0	$271,000	$0	$163,000	$2,190	$526,000
STB-6	$5,940,000	$47,400	$13,100,000	$0	$0	$0	$163,000	$2,040	$19,300,000
STB-7	$11,500	$119,000	$36,700	$0	$0	$0	$81,300	$30,200	$279,000
STC-1	$7,320,000	$65,600	$806,000	$0	$0	$0	$81,300	$223	$8,270,000
STC-2	$30,200,000	$109,000	$1,450,000	$0	$0	$0	$81,300	$2,610	$31,900,000
VEN-1	$555,000	$19,000	$10,000,000	$0	$0	$0	$81,300	$1,450	$10,700,000
VEN-2	$0	$37,100	$0	$0	$0	$1,400	$0	$8,180	$46,700
VEN-3	$0	$65,800	$1,210	$0	$0	$0	$163,000	$2,490	$232,000
YUB-1	$903,000	$29,000	$0	$690,000	$0	$0	$0	$38,700	$1,660,000
Total	**$1,110,000,000**	**$2,930,000**	**$219,000,000**	**$8,950,000**	**$2,220,000**	**$24,800**	**$2,440,000**	**$489,000**	**$1,340,000,000**

Note: Totals may not sum due to rounding.

EXHIBIT ES-5 SUMMARY OF POST-DESIGNATION INCREMENTAL IMPACTS BY UNIT AND ACTIVITY: HIGH-END SCENARIO
(PRESENT VALUE, 2009 DOLLARS, SEVEN PERCENT)

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	GRAZING	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
ALA-1A	$3,940,000	$532	$0	$6,350	$0	$0	$0	$0	$7	$3,940,000
ALA-1B	$45,800,000	$1,460	$0	$17,700	$0	$0	$0	$0	$20	$45,900,000
ALA-2	$79,300,000	$17,100	$94,100	$267,000	$0	$0	$0	$4,090	$555	$79,700,000
BUT-1	$0	$0	$0	$0	$2,800	$0	$0	$0	$0	$2,800
CAL-1	$7,030,000	$0	$0	$0	$0	$0	$0	$0	$0	$7,030,000
CCS-1	$3,130,000	$2,490	$56,500	$0	$0	$0	$0	$2,040	$35	$3,190,000
CCS-2	$50,200,000	$23,900	$248,000	$0	$0	$7,350	$0	$6,130	$335	$50,500,000
ELD-1	$9,340,000	$0	$14,000	$0	$1,500	$0	$0	$0	$0	$9,350,000
LOS-1	$0	$0	$0	$0	$0	$0	$3,270	$0	$2,170	$5,430
MEN-1	$8,480,000	$0	$0	$0	$0	$0	$0	$0	$0	$8,480,000
MNT-1	$0	$86	$0	$0	$0	$0	$0	$0	$18	$104
MNT-2	$23,100,000	$19,800	$5,240,000	$0	$0	$10,900	$0	$2,040	$4,270	$28,400,000
MNT-3	$65,100	$4,550	$2,940	$0	$0	$0	$0	$0	$1,000	$73,600
MRN-1	$553,000	$0	$1,810	$0	$0	$0	$0	$0	$448	$555,000
MRN-2	$2,000,000	$0	$113,000	$0	$0	$0	$0	$0	$1,290	$2,110,000
MRN-3	$964,000	$0	$336,000	$0	$0	$0	$0	$0	$1,950	$1,300,000
NAP-1	$53,400	$0	$272	$0	$0	$0	$0	$0	$0	$53,700
NEV-1	$5,060,000	$0	$891	$0	$3,280	$0	$26,800	$0	$0	$5,090,000
PLA-1	$111	$2,640	$0	$0	$1,470	$0	$12,000	$0	$0	$16,200
RIV-1	$81,500	$0	$441	$0	$0	$0	$0	$0	$0	$81,900
SCZ-1	$15,100,000	$15,700	$10,100,000	$0	$0	$918	$0	$2,040	$23,500	$25,200,000
SCZ-2	$1,100,000	$901	$327,000	$0	$0	$918	$0	$0	$1,370	$1,430,000
SLO-1	$5,960,000	$1,500	$168,000	$0	$0	$0	$0	$4,090	$4,160	$6,140,000
SLO-2	$31,600,000	$11,800	$3,060,000	$0	$0	$0	$0	$2,040	$3,350	$34,600,000
SLO-3	$79,400,000	$12,300	$15,600,000	$0	$0	$3,800	$0	$4,090	$3,630	$95,000,000

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	GRAZING	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
SLO-4	$2,780,000	$3,460	$3,570	$0	$0	$0	$0	$0	$1,090	$2,790,000
SNB-1	$491,000	$1,790	$10,800,000	$0	$0	$0	$0	$0	$352	$11,300,000
SNB-2	$4,590	$855	$1,870	$0	$0	$0	$0	$2,040	$169	$9,530
SNB-3	$1,500,000	$3,160	$1,590,000	$0	$0	$0	$0	$2,040	$623	$3,090,000
SNM-1	$11,000,000	$3,080	$454,000	$0	$0	$0	$0	$2,040	$82	$11,500,000
SNM-2	$53,700,000	$8,580	$1,210,000	$0	$0	$0	$0	$0	$510	$54,900,000
SOL-1	$1,160,000	$0	$981	$0	$0	$0	$0	$2,040	$0	$1,160,000
SOL-2	$1,560,000	$0	$58,000	$0	$0	$0	$0	$2,040	$0	$1,620,000
SOL-3	$1,760,000	$0	$288,000	$0	$0	$0	$0	$2,040	$0	$2,050,000
SON-1	$21	$0	$169	$0	$0	$0	$0	$0	$0	$190
SON-2	$169,000	$0	$176	$0	$0	$0	$0	$0	$0	$169,000
SON-3	$133,000	$0	$240	$0	$0	$0	$0	$0	$44	$133,000
STB-1	$4,220	$2,660	$0	$0	$0	$0	$0	$0	$1,500	$8,380
STB-2	$5,840,000	$3,800	$533,000	$0	$0	$0	$0	$2,040	$2,020	$6,380,000
STB-3	$17,100	$5,030	$40,800	$0	$0	$0	$0	$0	$2,850	$65,700
STB-4	$0	$919	$0	$0	$0	$0	$0	$0	$487	$1,410
STB-5	$83,200	$1,360	$168,000	$0	$0	$3,320	$0	$4,090	$729	$261,000
STB-6	$2,110,000	$1,270	$5,270,000	$0	$0	$0	$0	$4,090	$680	$7,390,000
STB-7	$476,000	$20,400	$1,430,000	$0	$0	$0	$0	$2,040	$10,100	$1,940,000
STC-1	$10,600,000	$2,500	$159,000	$0	$0	$0	$0	$2,040	$74	$10,800,000
STC-2	$37,000,000	$7,440	$432,000	$0	$0	$0	$0	$2,040	$870	$37,400,000
VEN-1	$149,000	$1,500	$575,000	$0	$0	$0	$0	$2,040	$483	$728,000
VEN-2	$0	$2,700	$0	$0	$0	$0	$466	$0	$2,730	$5,890
VEN-3	$3,660,000	$2,570	$404	$0	$0	$0	$0	$4,090	$829	$3,670,000
YUB-1	$713,000	$0	$0	$0	$2,160	$0	$0	$0	$0	$715,000
Total	**$507,000,000**	**$188,000**	**$58,300,000**	**$291,000**	**$11,200**	**$27,200**	**$42,600**	**$61,300**	**$74,300**	**$566,000,000**

Note: Totals may not sum due to rounding.

EXHIBIT ES-6 DISTRIBUTION OF HIGH-END BASELINE DEVELOPMENT IMPACTS BY UNIT
(PRESENT VALUE, 2009 DOLLARS, SEVEN PERCENT)

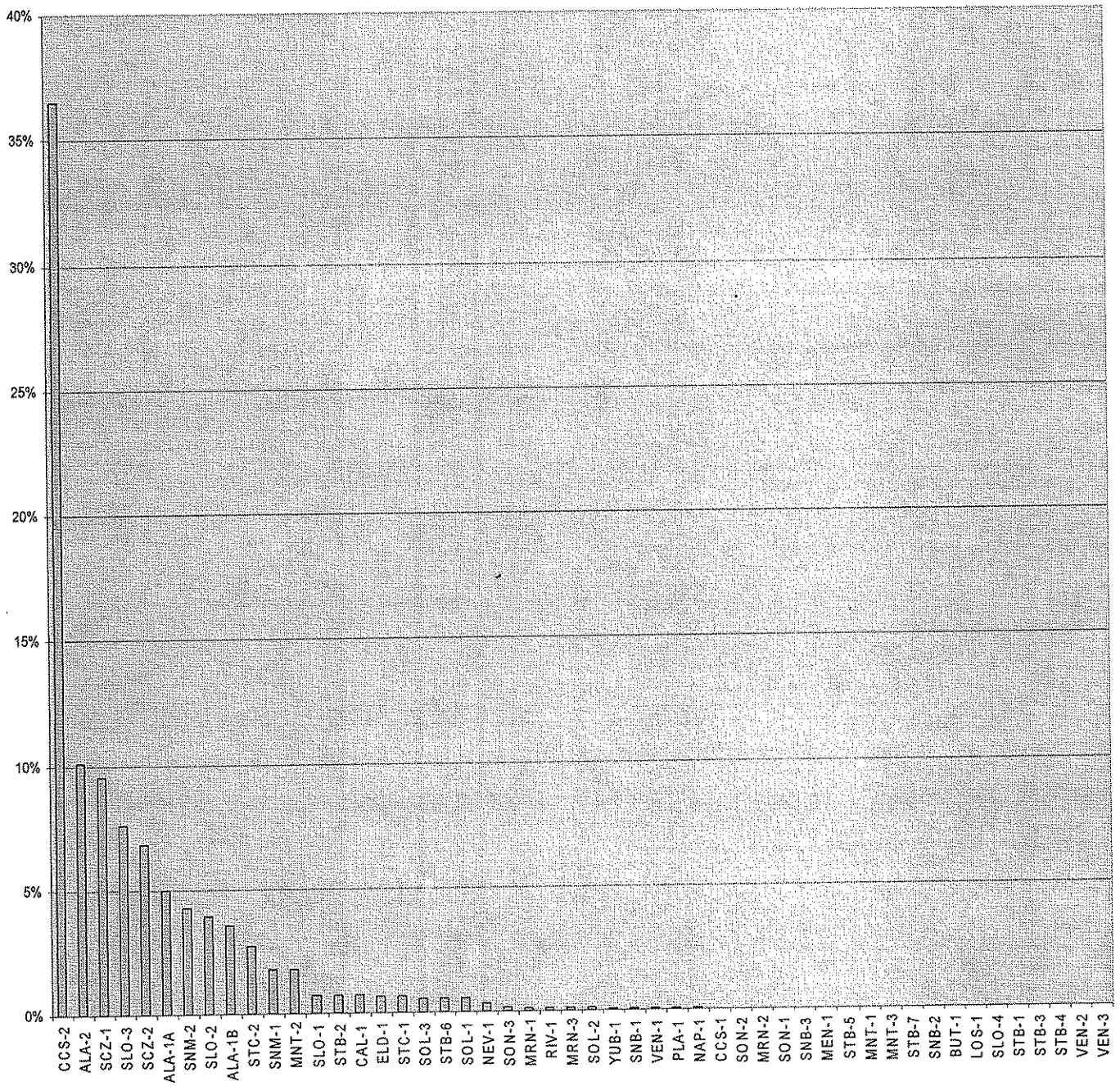

EXHIBIT ES-7 DISTRIBUTION OF HIGH-END INCREMENTAL DEVELOPMENT IMPACTS BY UNIT
(PRESENT VALUE, 2009 DOLLARS, SEVEN PERCENT)

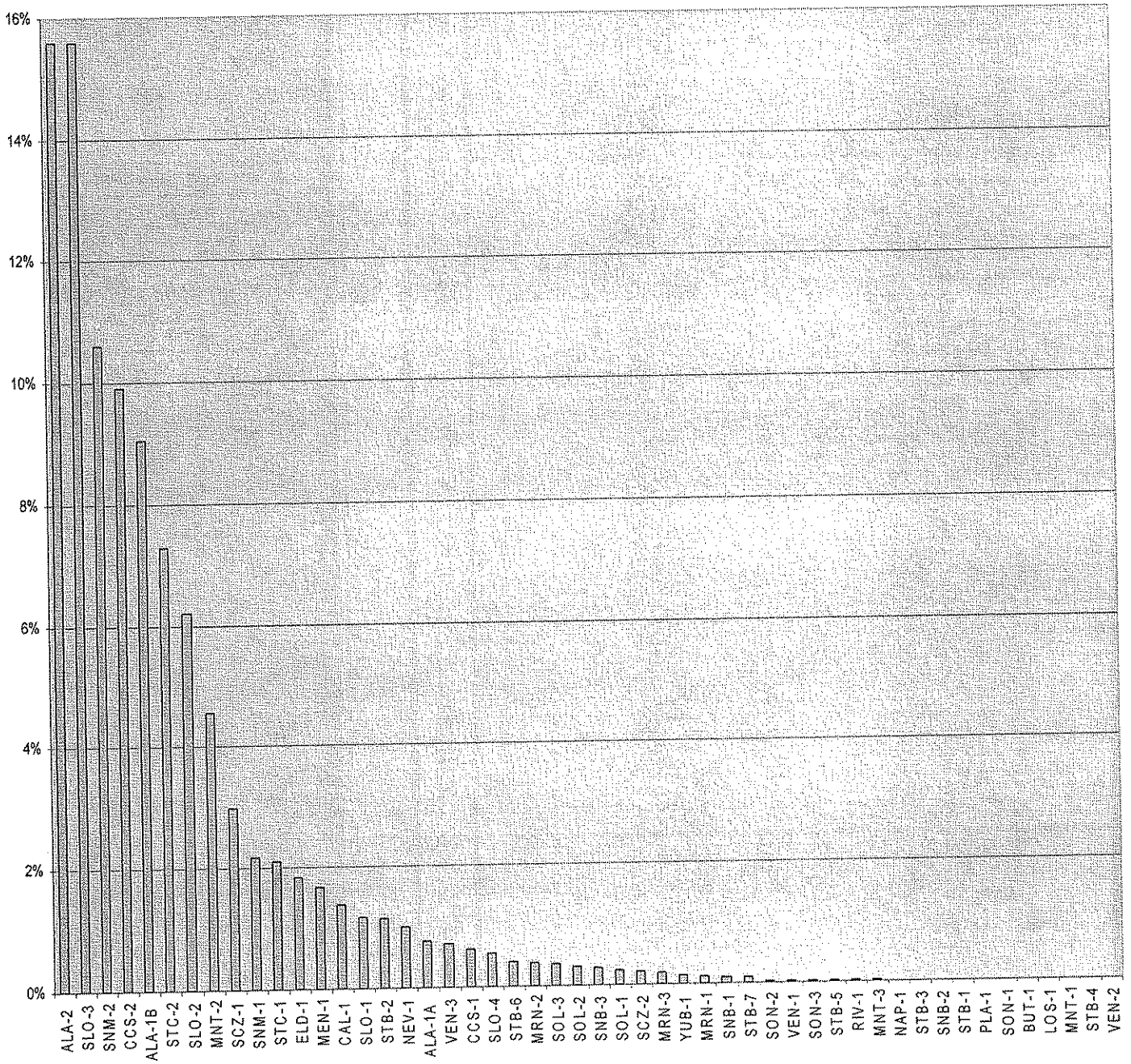

EXHIBIT ES-8 UNITS RANKED BY INCREMENTAL IMPACTS: HIGH-END SCENARIO (PRESENT VALUE, 2009 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

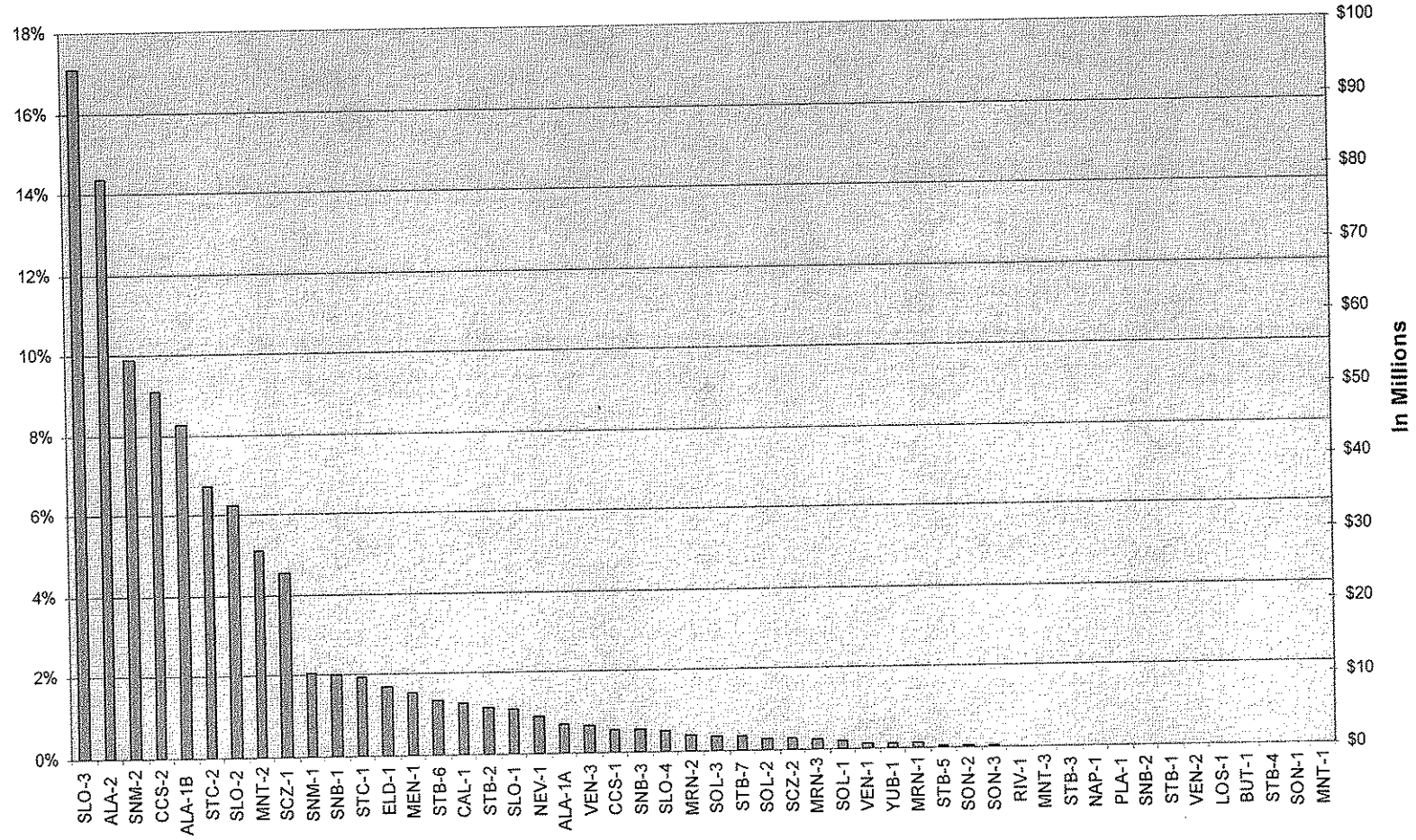

EXHIBIT ES-9 POST-DESIGNATION BASELINE IMPACTS RANGE BY SUBUNIT (PRESENT VALUE, 2009 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

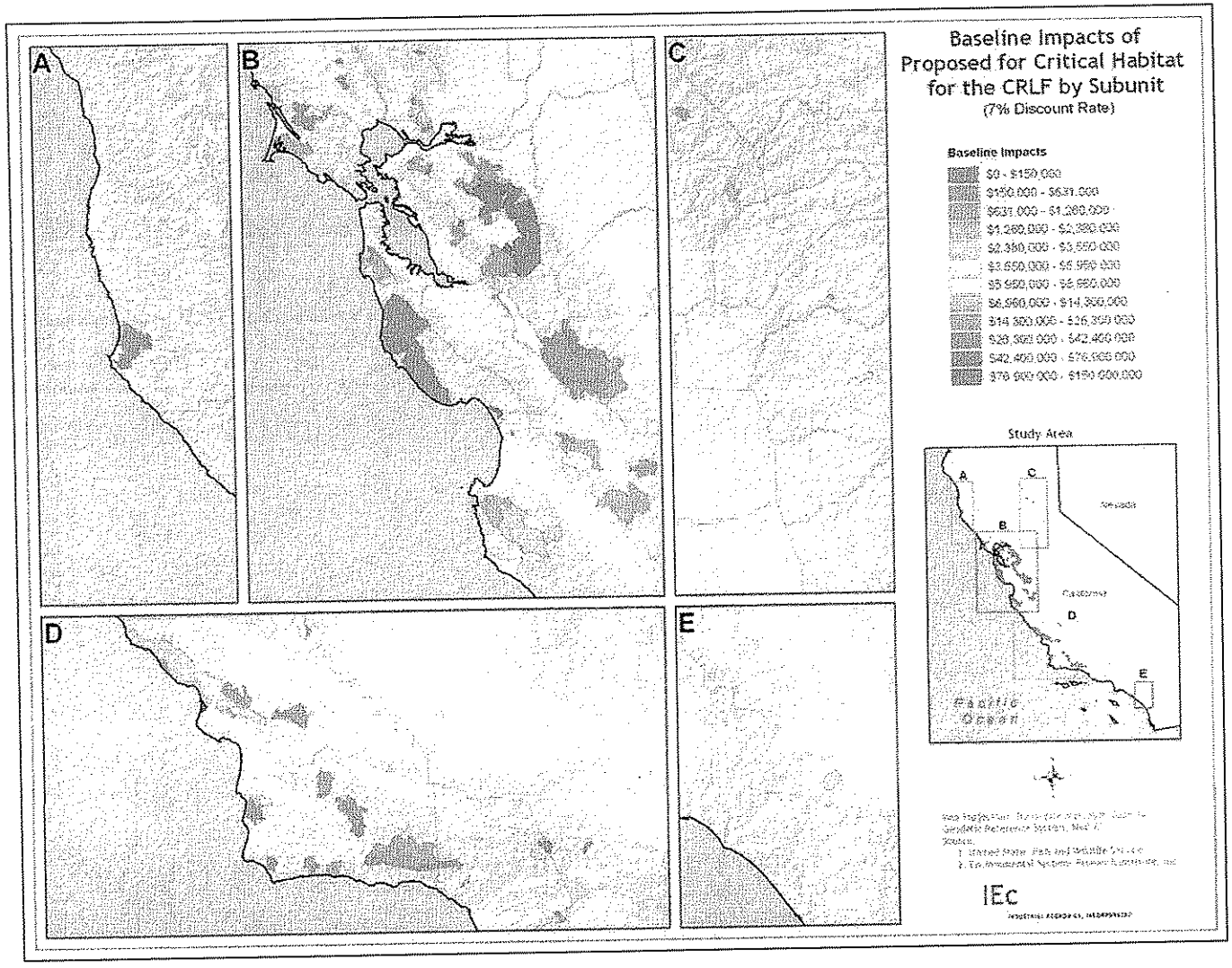

EXHIBIT ES-10 POST-DESIGNATION INCREMENTAL IMPACTS RANGE BY SUBUNIT (PRESENT VALUE, 2009 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

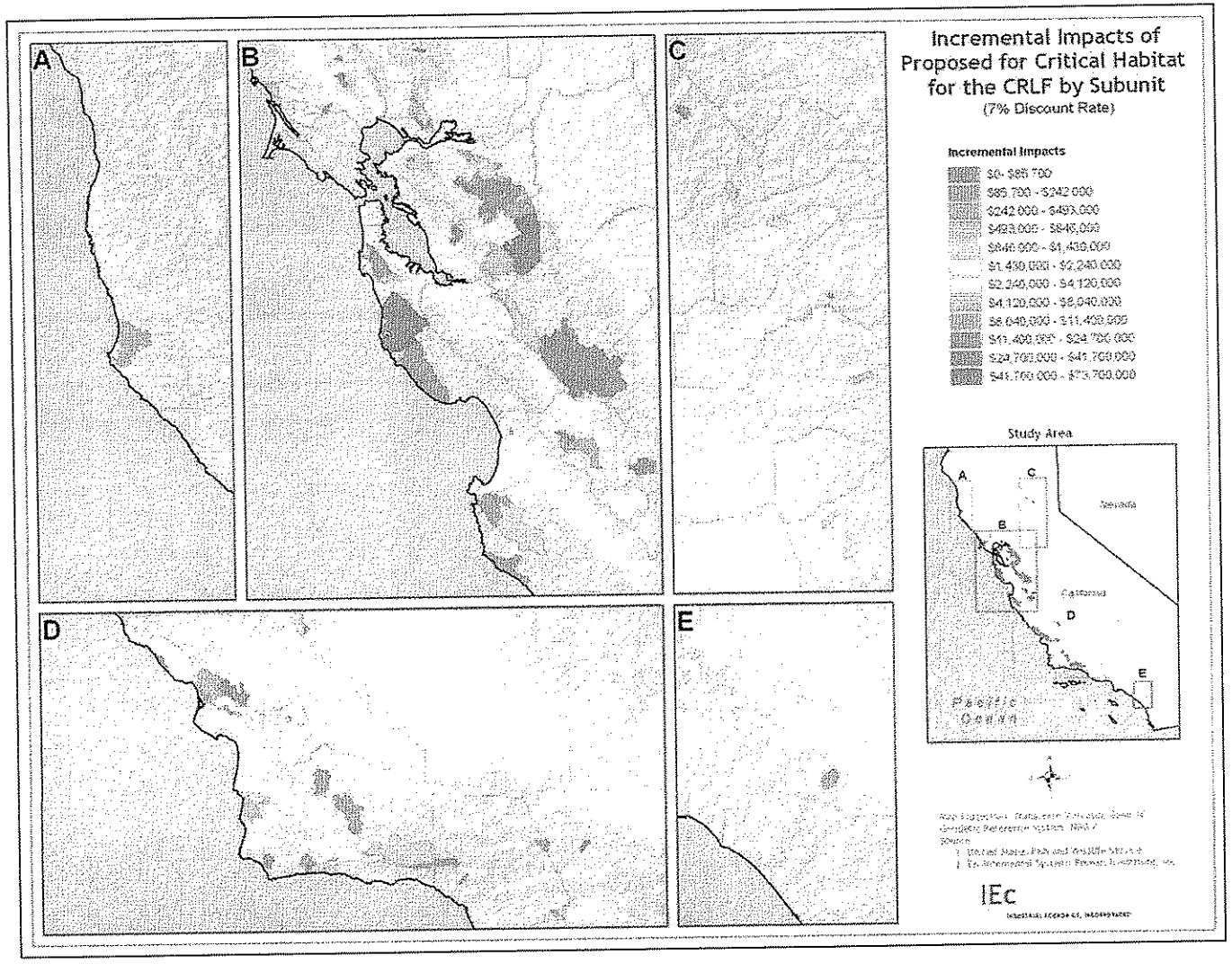

EXHIBIT ES-11 TOP TWENTY CENSUS TRACTS RANKED BY INCREMENTAL IMPACTS (PRESENT VALUE, 2009 DOLLARS, SEVEN PERCENT)

LOW-END SCENARIO				HIGH-END SCENARIO			
RANK	SUBUNIT	PRESENT VALUE IMPACTS	PERCENTAGE OF IMPACTS	RANK	SUBUNIT	PRESENT VALUE IMPACTS	PERCENTAGE OF IMPACTS
1	ALA-2-6001451101	$17,900,000	9.8%	1	ALA-2-6001451101	$73,700,000	13.0%
2	SCZ-1-6087120200	$13,900,000	7.6%	2	SNM-2-6081613800	$53,900,000	9.5%
3	SNM-2-6081613800	$13,900,000	7.6%	3	ALA-1B-6001435101	$41,700,000	7.4%
4	SLO-3-6079010800	$10,300,000	5.6%	4	STC-2-6085512700	$35,800,000	6.3%
5	ALA-1B-6001435101	$10,000,000	5.5%	5	SLO-2-6079010400	$31,300,000	5.5%
6	SNB-1-6069000800	$9,900,000	5.4%	6	SLO-3-6079012702	$30,700,000	5.4%
7	STC-2-6085512700	$8,850,000	4.8%	7	SCZ-1-6087120200	$24,700,000	4.4%
8	SLO-3-6079012702	$8,220,000	4.5%	8	CCS-2-6013355104	$24,200,000	4.3%
9	SLO-2-6079010400	$7,550,000	4.1%	9	MNT-2-6053011600	$20,800,000	3.7%
10	MNT-2-6053011600	$6,700,000	3.7%	10	SLO-3-6079011200	$20,400,000	3.6%
11	CCS-2-6013355104	$6,140,000	3.4%	11	SLO-3-6079010600	$16,900,000	3.0%
12	STB-6-6083002910	$6,100,000	3.3%	12	SLO-3-6079012704	$11,400,000	2.0%
13	SLO-3-6079010600	$6,030,000	3.3%	13	SNB-1-6069000800	$11,300,000	2.0%
14	SLO-3-6079011200	$4,920,000	2.7%	14	CCS-2-6001451101	$11,100,000	2.0%
15	MNT-2-6053011000	$3,350,000	1.8%	15	CCS-2-6013303200	$10,200,000	1.8%
16	SLO-2-6079010800	$3,080,000	1.7%	16	SLO-3-6079010800	$10,200,000	1.8%
17	SLO-3-6079012704	$2,760,000	1.5%	17	MEN-1-6045011100	$8,480,000	1.5%
18	CCS-2-6013303200	$2,750,000	1.5%	18	STC-1-6085512700	$8,040,000	1.4%
19	CCS-2-6001451101	$2,680,000	1.5%	19	STB-6-6083002910	$7,380,000	1.3%
20	CAL-1-6009000210	$2,150,000	1.2%	20	ELD-1-6017031405	$7,350,000	1.3%

* In order to estimate impacts by critical habitat unit, the impacts to all census tracts overlapping a given critical habitat unit are summed. Thus, a critical habitat unit that contains the census tract with the highest impacts may not be the same critical habitat unit with the highest overall impacts (i.e., the impacts to other census tracts within the same critical habitat unit may be small).

SUMMARY OF BASELINE IMPACTS

9. Baseline impacts associated with consideration of the frog and its habitat are estimated to be $593 million to $1.43 billion (approximately $37.2 million to $89.8 million on an annualized basis), assuming a three percent discount rate, or $510 million to $1.34 billion (approximately $46.1 million to $121 million on an annualized basis), assuming a seven percent discount rate. These costs are evidence of the significant regulatory protection that has been afforded this species by its listing under the Act as well as by the California Environmental Quality Act (CEQA). Census tract 06001451101 (within proposed Unit CCS-2) has the largest baseline impacts of the areas considered for designation, $150 million under the high-end scenario, assuming a discount rate of seven percent.

SUMMARY OF INCREMENTAL IMPACTS

10. Incremental impacts associated with consideration of the frog and its habitat are estimated to be $206 million to $589 million (approximately $12.9 million to $37.0 million on an annualized basis), assuming a three percent discount rate, or $183 million to $566 million (approximately $16.5 million to $51.2 million on an annualized basis), assuming a seven percent discount rate. Census tract 06001451101 (within proposed Unit ALA-2) has the largest incremental impacts of the areas considered for designation, $73.7 million under the high-end scenario, assuming a discount rate of seven percent.

DISCUSSION OF RESULTS

11. Under the high-end scenario (assuming a seven percent discount rate), impacts to urban development represent approximately 82 percent and 90 percent of the total post-designation baseline and incremental impacts, respectively. Agricultural activities account for an additional 16 percent and 10 percent of the total post-designation baseline and incremental impacts, respectively. Impacts to all other activities, combined, represent approximately one percent of the total post-designation baseline and incremental impacts.

RESIDENTIAL AND COMMERCIAL DEVELOPMENT

12. The main cost expected in the post-designation period results from delayed construction during the section 7 consultation process (on average nine months) and while developers assemble habitat offsets (on average two years). The loss is based on the opportunity cost to developers of carrying undeveloped land during those time periods. The delay cost is calculated by multiplying the value of the land to be developed with the market interest rate and the time period of the delay (i.e., nine months to two years). The differences in project modification costs in the low and high impact scenarios are overcome by these delay costs, which are the same for both scenarios.

13. Uncertainty regarding the type of project modifications required to offset impacts to the frog from urban development results in the evaluation of two scenarios. Under the first scenario, the Service may require compensating for impacts to the frog and its habitat from development activities by purchasing land and protecting it for the benefit of the frog. The average price per acre at local land conservation banks depends on the type of

compensating habitat required -- $11,000 per acre of dispersal habitat to $140,000 per acre for breeding habitat. Under the second scenario, the Service may recommend habitat restoration to offset development impacts, estimated to cost on average $50,000 per acre.

14. Development impacts vary widely both across the study area as well as within proposed critical habitat units. The counties of Alameda, Contra Costa, Santa Cruz, San Luis Obispo and San Mateo experience the greatest impacts due primarily to the high number of acres projected for development in each county within the study area. Land values also play a significant factor. Land values in Alameda, Contra Costa, San Mateo, and San Luis Obispo counties are among the highest in the study area – estimated at greater than $2.5 million per developed acre in some areas.

AGRICULTURE

15. Costs for protection of the frog and its habitat for agriculture activities are based on the conservation measures established by a Stipulated Injunction issued by the U.S. District Court for the Northern District of California on October 20, 2006. Specifically, the stipulated injunction imposes no-use buffer zones around upland and aquatic habitat and disallows the use of 66 pesticide active ingredients within those habitats and buffer zones (60 feet to 200 feet for ground and aerial applications, respectively). This analysis assumes that implementation of no-pesticide use areas will effectively result in the loss of agricultural production in affected areas. As part of the stipulated injunction, the U.S. Environmental Protection Agency (EPA) is required to prepare effects determinations for each pesticide active ingredient and initiate consultation with the Service. To the extent that future consultation with the Service on each pesticide active ingredient find more flexible ways to avoid jeopardy or adverse modification (e.g., adjustments in cropping or pesticide use practices), agricultural impacts in the post-designation period may be overstated. Furthermore, the analysis of agricultural activities does not take into account the potential for the conversion of agricultural lands to non-agricultural uses such as residential or commercial development; future land use changes may affect the report's results.

KEY SOURCES OF UNCERTAINTY

16. In proposed critical habitat areas, the key factor determining whether incremental impacts are expected is the likelihood that project proponents will detect the frog during pre-activity assessments and surveys. This analysis relies on guidance issued by the Service in 1997 and revised in 2005 to assist project proponents in assessing the likelihood of frog presence on their property or in the vicinity of the proposed project area. One of the primary data sources used by project proponents is the California Natural Diversity Data Base (CNDDB) maintained by the California Department of Fish and Game Natural Heritage Division. The CNDDB is a repository of reported sightings of rare species and natural communities and is updated on a regular basis as new data becomes available. Discussions with stakeholders indicate that the CNDDB is a well-known resource used by project proponents to assess frog presence within a project area. This analysis relies on

the CNDDB to identify areas where a project proponent would likely detect the frog. Impacts in these areas are attributed to the baseline.

17. In areas without any reported frog sightings in the CNDDB, the Service typically requires focused field surveys as well as site-specific assessments of suitable habitat and habitat connectivity. Ideally, this analysis would rely on data about the frequency that these additional site assessment activities result in the detection of the frog. However, according to discussions with the Service, these data are not tracked. Accordingly, this analysis conservatively assumes that frogs will not likely be detected in these areas. To the extent that this approach under-estimates the likelihood that frogs will be detected in a proposed critical habitat unit, baseline impacts will be understated and incremental impacts will be overstated.

18. Impact estimates are driven by delay costs, which rely on point estimates of the typical length of delay likely to be experienced by developers. The delay associated with the section 7 consultation process is assumed to be nine months, and the delay associated with assembling habitat offsets requested by the Service during section 7 consultation or by local authorities through the CEQA process is assumed to be two years. Furthermore, these delays are assumed to be sequential. If these assumptions represent worst-case, rather than average, delay times, impacts are likely overstated.